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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,869

12/07/2007

Peter Taube

VALEA 3.3-032

8201

530 7590 11/18/2009
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EXAMINER

JOHNSON, MATTHEW A

ART UNIT

PAPER NUMBER

3656

MAIL DATE

DELIVERY MODE

11/18/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,869	Applicant(s) TAUBE ET AL.	
	Examiner MATTHEW A. JOHNSON	Art Unit 3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,10,12-17 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,10,12-17 and 19-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2009 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 12-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claims 12, 14, 15 and 16: Claims 12, 15 and 16 have been amended to depend off of claim 1. Claim 1 has been amended to incorporate the limitation "a displaceable shaft comprising a ball screw portion and a ball return portion". The limitations of claims 12, 14, 15 and 16 appear to refer to a ball return portion provided in the ball nut. It is unclear how the ball return can be in the shaft as recited in claim 1, and also in the ball nut, as recited in claims 12, 15 and 16.

3. Re clms 13 and 17: Claim 13 recites the limitation "to change track to the adjacent track" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. Claim 17 recites the limitation "the balls" and "the ball tracks of the nut" in line 4. There is insufficient antecedent basis for this limitation in the claim. **Note:** Claims 13 and 17 have been amended to depend off of claim 1, which has not previously recited a "track" or "balls".

Drawings

4. The drawings are objected to because in figures 6-10, the lines are not uniformly thick (as required by 37 CFR 1.84(l)) and solid black shading is not permitted (as required by 37 CFR 1.84(m)). **Note:** Applicant submitted replacement sheets for Figs. 6-10, however the drawings contain solid black shading making it hard to identify the details of the invention. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 13, 17, 20 and 21, are rejected under 35 U.S.C. 102(b) as being anticipated by Perni et al. (USP-7,121,379).

Re claims 1, 20 and 21: Perni discloses a vehicle having steering wheels (2, Fig. 1) and including an electric motor (4, Fig. 2) comprising:

- An input for receiving an electrical signal from a control unit (C3 L1-11) of said vehicle
- A housing (3) encapsulating a rotating member (9), said rotating member comprising a ball nut portion (10, 11)
- One or several arrangements (stator 5 and permanent magnets on rotor 6, C3 L9) for generating a magnetic field with respect to said electrical signal (C3 L1-11)
- A displaceable shaft (13) at each end connected to said steering wheels (2, Fig. 1) and comprising a ball screw portion (14) and a ball return portion (16, Fig. 2)
- A carrying sleeve (6) comprising on its outer surface magnetic elements (permanent magnets C3 L9), said carrying sleeve being provided on said rotating member (9) substantially parallel with an extension direction of

said shaft for interaction with said one or more several arrangements for generating a magnetic field and rotating said ball nut (Fig. 2)

- Said one or several arrangements for generating a magnetic field are configured to generate a magnetic field when a current corresponding to said electrical signal flows through said arrangements and to interact with said magnetic elements to produce a torque, which rotates the sleeve and the ball nut forcing said shaft to displace linearly (C3 L1-14) to said steering wheels

Re clm 13: Perni discloses said ball return (16) comprises a single linear screw (Fig. 2) in which a notch (22) forces balls (15) passing through the notch to change track to the adjacent track (Fig. 2).

Re clm 17: Perni discloses said ball return (16) comprises a liner return (21) placed in the shaft and the balls (15) are lead through a path (16) over a portion between the ball tracks of the nut (Fig. 2).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. Claims 1, 13, 17, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al. (USP-6,244,374) in view of Perni et al. (USP-7,121,379).

Re claims 1, 20 and 21: Tomita discloses a vehicle having steering wheels (C3 L27-28) and including an electric motor (50) comprising:

- An input for receiving an electrical signal from a control unit (C3 L65-67) of said vehicle
- A housing (10) encapsulating a rotating member (42), said rotating member comprising a ball nut portion (C3 L51-56, Fig. 1)
- One or several arrangements (52a, 51b, 52b, 52c, Fig. 2) for generating a magnetic field with respect to said electrical signal (C4 L1-67)
- A displaceable shaft (30) at each end connected to said steering wheels (via 32 and 33, Fig. 1) and comprising a ball screw portion (41)
- A carrying sleeve (51) comprising on its outer surface magnetic elements (51b, Fig. 2), said carrying sleeve being provided on said rotating member (42, Fig. 1) substantially parallel with an extension direction of said shaft for interaction with said one or more several arrangements for generating a magnetic field and rotating said ball nut (Fig. 2, C4 L1-67)
- Said one or several arrangements for generating a magnetic field are configured to generate a magnetic field when a current corresponding to said electrical signal flows through said arrangements and to interact with said magnetic elements to produce a torque, which rotates the sleeve and

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the ball nut forcing said shaft to displace linearly (C4 L1-67) to said steering wheels

While Tomita does indeed disclose a ball-screw mechanism (40) having a return portion, Tomita does not disclose the displaceable shaft comprising a ball return portion.

Perni teaches a power assist steering device comprising a displaceable shaft (13) having a ball return portion (16, Fig. 2), for the purpose of providing a simple and economic ball recirculating passage that requires less machining (C1 L25-28 and C3 L15-19).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to have modified the device of Tomita such that the ball return portion is formed in the shaft, as taught by Perni, for the purpose of providing a simple and economic ball recirculating passage that requires less machining (C1 L25-28 and C3 L15-19).

Re clm 13: Perni further teaches said ball return (16) comprises a single linear screw (Fig. 2) in which a notch (22) forces balls (15) passing through the notch to change track to the adjacent track (Fig. 2).

Re clm 17: Perni further teaches said ball return (16) comprises a liner return (21) placed in the shaft and the balls (15) are lead through a path (16) over a portion between the ball tracks of the nut (Fig. 2).

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9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al. (USP-6,244,374) in view of Perni et al. (USP-7,121,379) further in view of Koharagi et. al. (USP-6,376,958).

Re clm 10: Tomita in view of Perni disclose all of the claim limitations as described above.

Tomita does not disclose the sleeve is made of a laminated material.

Koharagi teaches a sleeve (7) made of a laminated material (see Abstract) for the purpose of reducing harmonic loss caused by the shaft (C2 L11-31).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have made the sleeve of Tomita form a laminated material, as taught by Koharagi, for the purpose of reducing harmonic loss caused by the shaft (C2 L11-31).

Claims 12 and 14-16, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al. (USP-6,244,374) in view of Perni et al. (USP-7,121,379) further in view of Nishimura (USP-7,350,434).

Re clms 12 and 14-16: Tomita in view of Perni teach all of the claim limitations as described above.

Tomita does not disclose the ball return comprises a notch arranged diagonally on the ball nut, a preload system, a return cap having a return channel (56, 60) and a wiper arranged between the return cap and the shaft, and grooves or ball tracks in which the balls return, said ball return comprises a single or multi liner system.

Nishimura discloses a ball return (Figs. 1 and 7) comprising a notch arranged diagonally on a ball nut (Fig. 7) a preload system (20), a return cap (5) having a return channel (56, 60) and a wiper (7) arranged between the return cap and the shaft (1, Fig. 1), and grooves or ball tracks (56, 60) in which the balls return, said ball return comprising a single or multi liner system, in order to achieve the predictable result of providing a recirculation system for the ball screw mechanism.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the device of Tomita in view of Perni such that said ball return comprises a notch arranged diagonally on the ball nut, a preload system, a return cap having a return channel and a wiper arranged between the return cap and the shaft, and grooves or ball tracks in which the balls return, said ball return comprises a single or multi liner system, as taught by Nishimura, in order to achieve the predictable result of providing a recirculation system for the ball screw mechanism.

10. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al. (USP-6,244,374) in view of in view of Perni et al. (USP-7,121,379) further in view of Godek (USP-6,026,924).

Re clm 19: Tomita does not explicitly disclose said housing is at least partly filled with a lubrication agent.

Godek teaches a steering device having a housing at least partly filled with a lubrication agent (68, see Fig. 1) for the purpose of providing a damping characteristic in the steering system offering better control (C3 L4-27).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the device of Tomita in view of Perni, such that said housing is at least partly filled with a lubrication agent, as taught by Godek, for the purpose of providing a damping characteristic in the steering system offering better control (C3 L4-27).

Response to Arguments

11. Applicant's arguments with respect to claim 1 regarding the claimed ball return portion being provided in the displaceable shaft, have been considered but are moot in view of the new ground(s) of rejection.

12. Applicant's arguments with respect to claim 1 regarding the magnetic field generating elements have been fully considered but they are not persuasive.

Applicant argues that regarding Tomita, the mere reference to an electric motor in no way teaches or suggests the actual generating of a magnetic field. In response, Tomita clearly discloses in column 4 lines 1-67 that the operation of the motor includes the generation of a magnetic field. The electric motor is also shown in Fig. 2 as having permanent magnets (51b) that inherently generate a magnetic field.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW A. JOHNSON whose telephone number is (571)272-7944. The examiner can normally be reached on Monday - Friday 9:00a.m. - 5:30p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW A JOHNSON/
Examiner, Art Unit 3656

/Richard WL Ridley/
Supervisory Patent Examiner, Art Unit 3656